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DEPARTMENT OF COMMERCE

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STREET PAVING IN REPRESENTATIVE AMERICAN CITIES, 1925-1929

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STREET PAVING IN REPRESENTATIVE AMERICAN CITIES, 1925-1929[1]

By Arthur H. Redfield[2]

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INTRODUCTION

The expansion of city street paving which characterized the ten years ended December 31, 1929, according to a survey of 201 representative cities made by the Bureau of Mines, reached its climax in 1927, with decreases reported for 1928 and 1929. The upward trend, followed by a decline, was general in cities of all sizes included in this study, but was most pronounced in cities of 40,000 to 100,000 inhabitants and in the Northeastern, Southeastern, and Southwestern States. In the North-Central States the trend of paving was downward from 1925 to 1929; in the Pacific and Rocky Mountain States it was generally upward.

Over the nation as a whole, bituminous types of paving continued to lead, furnishing two-thirds of the total street pavement laid in the 201 cities from 1925 to 1929. The actual yardage of bituminous pavement laid in these cities, however, was 3.8 per cent less in 1929 than in 1925, and the ratio of bituminous pavement to the total pavement dropped from 70.4 per cent in 1925 to 62.1 per cent in 1928, rising to 65.1 per cent in 1929. The area paved with Portland-cement concrete amounted to only one-fourth of the total pavement laid in these cities from 1925 to 1929, but the yardage of Portland-cement pavement increased by half during the period, and its share in the total pavement grew from 19.3 per cent in 1925 to 30.0 per cent in 1928, declining to 28.5 per cent in 1929. Brick, block, and stone pavements, which constituted the remaining one-twelfth of the total pavement laid in the 201 cities, decreased one-third in yardage, and declined in relative importance from 10.3 per cent in 1925 to 6.6 per cent in 1929.

Local preferences, based on such various factors as availability and cost of the different paving materials, cost of initial laying, local traffic conditions, or even custom and tradition, largely govern the choice of the type of street pavement. For example, bituminous pavements constituted 93.3 per cent of the total street surfacing laid in Michigan from 1925 to 1929, inclusive, but only 52 per cent of the total pavement in the adjacent State of Ohio, 57.9 per cent in Indiana, and 56.9 per cent in Illinois. In New Jersey they constituted 90.3 per cent of the whole, but in New York only 79.1 per cent, and in Pennsylvania only 73.5 per cent. In Massachusetts they amounted to 82.0 per cent of the total pavement, and in Connecticut to 97.0 per cent. In like manner, Portland-cement concrete formed 40.9 per cent of the total pavement in Indiana, but only 33.2 per cent in Illinois, 17.0 per cent in Ohio, and 6.0 per cent in Michigan. In the Middle Atlantic States, Portland-cement concrete made up 10.4 per cent of the whole in Pennsylvania, but only 6.9 per cent in New York, and 5.0 per cent in New Jersey. In New England 7.5 per cent of the street area in Massachusetts was surfaced with Portland-cement concrete but only 2.7 per cent in Connecticut. Similarly, brick, block, and stone pavements formed 30.8 per cent of the whole area in Ohio, but only 1.2 per cent in Indiana, 0.7 per cent in Michigan, and 9.9 per cent in Illinois. In Pennsylvania they constituted 16.0 per cent of the entire street surface; in New York, 14.0 per cent; but in New Jersey, only 4.7 per cent.

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Size of cities was more influential in determining the distribution of certain types of pavement than of others. Differences in paving practice between the larger and the smaller cities were more marked in the case of the bituminous pavements. Sheet asphalt was favored by the larger cities; asphaltic concrete in the medium-sized and smaller cities; and asphaltic macadam in the smaller cities of the group studied. The use of Portland-cement concrete in each group of cities according to size was generally proportional to the share of each group in the total paving. Most of the brick, block, and stone was laid in the largest cities of over 1,000,000 population and in the smallest cities, having 40,000 to 100,000 inhabitants.

ACKNOWLEDGMENT

The cooperation of the Bureau of Foreign and Domestic Commerce and of several of its district offices and cooperative offices in various parts of the United States is gratefully acknowledged.

SCOPE AND METHOD OF INVESTIGATION

The foregoing conclusions were based on statistics, compiled by the Bureau of Mines in connection with the asphalt chapter of Mineral Resources of the United States, of street pavement laid in 201 representative cities of the United States from 1925 to 1929, inclusive. Since street paving and road surfacing constitute the largest single commercial use of asphalt, accounting for 44 per cent of all asphalts sold in the United States, trends in street and highway paving form a factor of economic importance in relation to the national demand for asphalt. Moreover, it is important to know whether increased or decreased sales of paving asphalt in any given year are in conformity with the general trend of paving and road building. Statistics of rural highway construction, both by States and by counties and townships, are compiled and published by the Bureau of Public Roads of the Department of Agriculture. No public agency, however, has hitherto undertaken to compile statistics of city street paving. It is the purpose of this study to supply in part that lack and to furnish a statistical basis for estimating trends in the laying of street pavements in general and of asphaltic pavements in particular.

Inquiries were addressed to the city engineers, superintendents of highways, or corresponding officials of 230 municipalities with populations exceeding 40,000 according to the estimates of the Bureau of the Census for 1928. Where no city or town in a given State contained as many as 40,000 inhabitants, inquiry was made of the largest city or town in that State. The officials in charge of street paving were requested to report the number of square yards of each type of street pavement laid in their respective cities for a series of years ended December 31,1929. Sufficient data for the purposes of the inquiry were received from 201 cities, distributed over 46 States and the District of Columbia and containing an aggregate population of 42,376,000 in 1930. The cities included in the survey accordingly comprise 94.5 per cent of the population of the United States living in communities of over 40,000 inhabitants. The

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survey covers all of the population living in cities of over 1,000,000 inhabitants, and all living in the cities containing from 500,000 to 1,000,000 residents, as well as 96.7 per cent of the population residing in cities of 250,000 to 500,000 inhabitants, 93.0 per cent of the population living in cities of 100,000 to 250,000, and 80.3 per cent of the population enrolled in communities of 40,000 to 100,000.

No endeavor was made to include all communities in the present figures and no effort was made to account for all the asphalt, Portland cement, vitrified brick, stone block or other materials used for paving within the United States in any one year. The purpose of the survey was to obtain over a series of years comparable figures from a sufficient number of representative American cities to permit the study of trends or tendencies in city street paving. While the collection of figures from cities of less than 40,000 inhabitants would be of interest, consideration of the time and labor involved compelled the restriction of the investigation to such a number of cities as could be conveniently handled.

One of the difficulties of such a study is the lack of uniformity in the method of keeping statistics of street paving from city to city. For instance, in some cities paved alleys as well as gutters and curbs are included, but for most cities the figures refer solely to the central roadway of traveled streets. Statistics of new pavement and of resurfacing are carefully distinguished in some cities and are combined in others. Although most of the cities comprised in this survey kept their paving statistics by the calendar year, several important cities used fiscal years beginning on various dates. Figures for such cities have been placed in the calendar year to which each fiscal year most closely corresponds. Nevertheless, the statistics received from each city are on the same basis from year to year, and it is felt that a summation of such statistics will provide an accurate analysis of existing tendencies in street paving.

In general, both new pavement and resurfacing are included in the tables in this report. Maintenance, repair, and patching work have for the most part been excluded. In the first place, comparatively few cities keep adequate statistics of the yardage of pavement laid in maintenance or repair. In the second place, such figures reveal little or nothing about the tendencies of paving. To a large extent a roadway is maintained or repaired with the same material of which it is constructed, and the element of free choice of material does not enter to the same degree that it does into new construction or into resurfacing.

Such factors as density of population, amount of taxable property, volume and nature of traffic, availability and cost of the various paving materials, and supply and cost of labor differ from section to section, from State to State, and even from city to city. There are marked differences in the paving practices of the various sections of the United States and between the larger and the smaller cities. Moreover, a five-year period does not adequately reveal tendencies in the construction of street improvements designed to last a generation with proper care. Of necessity, activity in paving is cyclical, especially

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in the smaller and less wealthy municipalities. More than one city, after raising money by a bond issue, has laid in a single year enough street pavement to meet its requirements for a decade, and in the next four or five years has limited its activities to maintenance and repair of existing pavements and to minor extensions of existing streets.

In considering trends, it is important to recognize that the various materials used for street-paving—asphalt, Portland cement, vitrified brick, stone block, and wood block—are not necessarily competitive; to a large extent they supplement each other. Sheet asphalt is used as a surface course over a base of Portland-cement concrete, vitrified brick, or stone block. Asphaltic concrete and sheet asphalt are used to patch and resurface worn pavements of Portland-cement concrete, vitrified brick, or stone. Liquid asphalt and asphaltic joint-filler are used to fill joints, crevices, and cracks in Portland-cement concrete, brick, or stone pavements. Portland-cement concrete and vitrified brick are used for gutters, curbs, and shoulders to bituminous roadways, as well as for bases for asphaltic surfaces. Portland-cement concrete has been used for patching and resurfacing cement, brick, and stone block pavements.

GENERAL DISCUSSION

The peak of street paving in the 201 cities was reached in 1927, when 57,944,251 square yards was laid. This was an increase of 8.2 per cent over the 53,538,760 square yards laid in 1926, and of 22.5 per cent over the 47,286,585 square yards in 1925. From the maximum attained in 1927, the 53,494,925 square yards laid in 1928 constituted a decrease of 7.7 per cent. Similarly, the 48,868,036 square yards laid in 1929 represented a decrease of 6.8 per cent from the yardage laid in 1928, but an increase of 3.3 per cent over that laid in 1925.

Two-thirds (65.4 per cent) of the total street area paved in the 201 cities from 1925 to 1929, inclusive, was surfaced with bituminous types of paving. These include petroleum asphalt or lake asphalt mixed with sand or crushed stone, in varying proportions; liquid or semiliquid asphalt or road oil applied to the surface of a macadam, gravel, or earth roadway; and native rock asphalt laid as a surface. A small and relatively insignificant yardage of coal-tar mixtures is included in the total bituminous pavement. One-fourth (25.3 per cent) of the total street area was surfaced with Portland-cement concrete. This does not include Portland-cement concrete used as a base for sheet asphalt pavements or for gutters, curbs, and shoulders to bituminous roadways. Only one-eleventh of the total street area was paved with vitrified brick, wood block, or stone block or slab.

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Total area of street pavement laid in 201 cities, 1925-1929, by types of paving
(In square yards)

	1925	1926	1927	1928	1929
Sheet asphalt	18,776,011	19,489,373	21,404,872	19,135,125	17,932,095
Asphaltic concrete	9,845,142	12,188,700	9,759,280	9,729,686	8,228,577
Asphaltic macadam	1,346,935	1,502,708	1,369,836	1,719,319	2,586,820
Asphalt block	416,523	961,495	991,092	203,987	133,728
Natural rock asphalt	852,725	814,444	1,163,335	1,099,940	1,086,780
Other asphaltic types	1,800,582	1,519,812	1,615,689	1,295,470	1,699,876
Tar macadam	114,433	39,055	27,917	10,099	10,000
Total bituminous	33,152,351	36,515,587	36,332,021	33,193,626	31,677,936
Portland-cement concrete	9,050,054	11,407,851	15,908,957	15,889,144	13,777,081
Brick, block, and stone	5,084,180	5,615,322	5,703,273	4,412,155	3,413,019
Total	47,286,585	53,538,760	57,944,251	53,494,925	48,868,036

The distribution of street paving by sections of the country is by no means proportional to the population. The 113 cities which represent the Northeastern district contained 68.1 per cent of the total population of the 201 cities, but laid only 55.5 per cent of the total pavement put down in the United States from 1925 to 1929, inclusive. On the other hand, the 22 cities of the Pacific-Rocky Mountain district contained only 10.2 per cent of the total population but laid 20.5 per cent of the total pavement. Similarly, the 28 Southeastern cities contained 7.5 per cent of the total population but laid 9.1 per cent of the total pavement; and the 18 cities of the North-Central district contained 5.3 per cent of the total population and laid 6.3 per cent of the total pavement. Cities of the Southwestern district, containing 8.9 per cent of the total population, laid 8.6 per cent of the total pavement.

Total area of street pavement laid in 201 cities, 1925-1929,
by geographic districts
(In square yards)

	1925	1926	1927	1928	1929
Northeastern	26,711,257	28,740,042	32,379,220	29,711,606	27,288,789
Southeastern	4,727,107	5,696,882	5,956,072	3,714,401	3,621,420
Southwestern	4,036,221	4,427,700	4,942,712	4,509,577	4,609,738
North Central	3,853,858	3,471,029	3,574,668	2,792,526	2,755,630
Pacific-Rocky Mountain	7,958,142	11,203,107	11,091,579	12,766,815	10,592,459
Total	47,286,585	53,538,760	57,944,251	53,494,925	48,868,036

From 1925 to 1929 the cities and towns with populations exceeding 500,000 laid less than their proportionate share of the total paving. The five Class A cities with populations exceeding 1,000,000--New York, Chicago, Detroit, Philadelphia, and Los Angeles--contained 35.6 per cent of the total population comprised in this survey but laid only 32.1 per cent of the total street pavement.

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in the smaller and less wealthy municipalities. More than one city, after raising money by a bond issue, has laid in a single year enough street pavement to meet its requirements for a decade, and in the next four or five years has limited its activities to maintenance and repair of existing pavements and to minor extensions of existing streets.

In considering trends, it is important to recognize that the various materials used for street-paving—asphalt, Portland cement, vitrified brick, stone block, and wood block—are not necessarily competitive; to a large extent they supplement each other. Sheet asphalt is used as a surface course over a base of Portland-cement concrete, vitrified brick, or stone block. Asphaltic concrete and sheet asphalt are used to patch and resurface worn pavements of Portland-cement concrete, vitrified brick, or stone. Liquid asphalt and asphaltic joint-filler are used to fill joints, crevices, and cracks in Portland-cement concrete, brick, or stone pavements. Portland-cement concrete and vitrified brick are used for gutters, curbs, and shoulders to bituminous roadways, as well as for bases for asphaltic surfaces. Portland-cement concrete has been used for patching and resurfacing cement, brick, and stone block pavements.

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Total	47,286,585	53,538,760	57,944,251	53,494,925	48,868,036

From 1925 to 1929 the cities and towns with populations exceeding 500,000 laid less than their proportionate share of the total paving. The five Class A cities with populations exceeding 1,000,000--New York, Chicago, Detroit, Philadelphia, and Los Angeles--contained 35.6 per cent of the total population comprised in this survey but laid only 32.1 per cent of the total street pavement.

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The eight Class B cities of 500,000 to 1,000,000 inhabitants--Baltimore, Boston, Buffalo, Cleveland, Milwaukee, Pittsburgh, St. Louis, and San Francisco--containing 13.5 per cent of the total population comprised in this survey laid only 9.3 per cent of the total pavement. By 1925 the larger, wealthier, and longer settled municipalities had already a large proportion of their street area surfaced. The 24 Class C 3/ cities of 250,000 to 500,000 inhabitants, which contained 18.9 per cent of the total population, laid 16.3 per cent of the total pavement. The 51 Class D 4/ cities, with 100,000 to 250,000 residents, contained 16.0 per cent of the total population, and laid 16.5 per cent of the entire area of street surfacing. On the other hand, the 113 Class E 5/ municipalities, with populations of less than 100,000, contained only 15.0 per cent of the total population, but laid 25.7 per cent of the street pavement. These communities, especially those which have grown rapidly in the last five years, have made greater efforts to pave streets in the territories which they have annexed or into which they have expanded.

Total area of street pavement laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A ...	13,083,312	15,884,959	18,856,836	18,714,749	17,315,158
Class B ...	4,083,575	4,717,941	5,525,020	5,111,777	5,011,890
Class C ...	8,522,775	8,263,222	9,104,521	8,484,832	8,296,574
Class D ...	8,244,707	9,394,458	8,927,954	8,672,320	7,912,153
Class E ...	13,352,216	15,278,180	15,729,920	12,511,247	10,332,261
Total ...	47,286,585	53,538,760	57,944,251	53,494,925	48,868,036

Nevertheless the net increase of 3.3 per cent in the total pavement from 1925 to 1929 was due to the activities of the larger cities; in the smaller cities there was a net decrease in paving, especially in 1928 and 1929. Whereas the five Class A cities laid 32.3 per cent more street pavement in 1929 than in 1925, and the eight Class B cities 22.7 per cent more, the 24 Class C cities laid 2.6 per cent less pavement in 1929 than in 1925, the 51 Class D cities 4.0 per cent less, and the 113 Class E cities 22.6 per cent less.

DISCUSSION BY TYPES

Bituminous Pavements

The amount of bituminous surfacing used on city streets ran fairly parallel to the general trend for all types of paving but reached its peak in 1926 instead of 1927. After increasing from 33,152,351 square yards in 1925 to 36,515,587 square yards in 1926, the total yardage of bituminous pavements declined to 36,332,021 square yards in 1927, to 33,193,626 square yards in 1928,

3/ For list of cities included in Class C, see footnote 6, p.28.
4/ For list of cities included in Class D, see footnote 7, p.29.
5/ For list of cities included in Class E, see footnote 8, p.30.

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and to 31,677,936 square yards in 1929. From 1927 to 1928, however, the decrease of 8.6 per cent in the area of bituminous paving coincided with a nation-wide decline of 7.7 per cent in all types of street paving from 1927 to 1928 but the decrease of 4.6 per cent from 1928 to 1929 in the area of bituminous paving laid fell short of the general decrease of 8.6 per cent in the yardage of all types of pavement. Bituminous types constituted 70.1 per cent of the total street pavement laid in 1925, 68.2 per cent in 1926, and 62.7 per cent in 1927. But, though the actual yardage of bituminous pavement laid decreased from 1928 to 1929, its ratio to the total pavement laid increased from 62.1 per cent in 1928 to 64.8 per cent in 1929.

Nearly four-sevenths (56.6 per cent) of all bituminous surfacing laid in the 201 cities from 1925 to 1929, inclusive, consisted of sheet asphalt. Nearly three-tenths (29.1 per cent) of the total comprised various types of asphaltic concrete. Included under this head are asphaltic concrete, "stone-filled sheet asphalt," warrenite-bitulithic, amiesite, Topeka, and willite. Only one-twentieth of the whole was formed by asphaltic penetration macadam. Native rock asphalt was used to surface only 2.9 per cent and asphalt block only 1.6 per cent of all street area paved with bituminous compounds. Miscellaneous bituminous types of surfacing, including national, bessonite, filbertine, oil macadam, coal-tar macadam, and others, furnished only 4.6 per cent of the whole.

Seven-tenths of all bituminous surfacing laid from 1925 to 1929, inclusive, in the 201 cities comprised in this survey was laid east of the Mississippi River. Three-fifths (61.9 per cent) of the total was put down in the Northeastern district, which lies north of the Potomac and Ohio Rivers and east of the Mississippi River and Lake Michigan. One-twelfth (8.9 per cent) of the total was laid in the Southeastern district, which occupies the area south of the Potomac and Ohio Rivers and east of the Mississippi and Pearl Rivers. Little more than one-eleventh (9.2 per cent) was used to surface city streets in the Southwestern district, lying west of the Mississippi and Pearl Rivers and south of St. Louis, Kansas City, Wichita, Amarillo, and El Paso. In the North-Central district, which extends west of Lake Michigan and the Mississippi River, north of St. Louis and Kansas City, and east of the Rocky Mountains, only 3.8 per cent of all the asphaltic pavements were laid. The remaining 16.2 per cent of all asphaltic pavements laid in the United States were put down in the Pacific-Rocky Mountain district, west of Great Falls, Cheyenne, Denver, Albuquerque, and El Paso.

Total area of bituminous street pavement laid in 201 cities, 1925-1929, by geographic districts
(In square yards)

	1925	1926	1927	1928	1929
Northeastern.....	20,230,775	21,573,507	22,534,567	21,386,441	20,008,024
Southeastern	3,006,718	3,302,104	4,181,856	2,297,148	2,460,448
Southwestern	2,901,661	3,098,945	3,497,737	3,173,950	2,981,378
North Central	1,818,340	1,490,024	1,335,433	1,026,948	894,121
Pacific-Rocky Mountain	5,194,857	7,051,007	4,782,428	5,309,139	5,333,965
Total	33,152,351	36,515,587	36,332,021	33,193,626	31,677,936

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In both the Northeastern and the Southwestern districts the yardage of bituminous pavement laid each year followed the national trend of bituminous paving, rising to a peak in 1927 and falling off in 1928 and 1929. In the Southeastern district both the increase from 1925 to 1927 and the decrease in 1928 and 1929 were proportionately much larger. A marked decrease both in quantity and in proportion took place in the North-Central district where bituminous paving fell off at an almost steady rate, until the yardage laid in 1929 was only 49.2 per cent of that laid in 1925. In the Pacific-Rocky Mountain district bituminous paving increased 35.7 per cent to its peak in 1926, then dropped 32.2 per cent in 1927, and rose 11.0 per cent in 1928 to a level which it maintained almost unchanged in 1929.

In comparison with the size of cities, the distribution of asphaltic surfacing of all types has been roughly parallel to the distribution of street paving in general. The five Class A cities, which laid 30.0 per cent of all street pavement, put down 33.3 per cent of the total asphaltic pavement. The eight Class B cities laid 9.9 per cent of the total pavement and 9.2 per cent of the asphaltic pavement. The 24 Class C cities which laid 17.1 per cent of the total pavement put down 14.6 per cent of the asphaltic types. The 51 Class D cities, which laid 16.2 per cent of the total pavement, laid 17.1 per cent of the asphaltic pavements. The 113 Class E cities laid 25.7 per cent of the total pavement and 26.8 per cent of the bituminous surfacing.

Total area of bituminous street pavement laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A ...	9,670,459	11,457,158	11,941,319	11,760,930	12,007,878
Class B ...	2,721,134	3,184,898	3,330,687	3,271,010	3,198,191
Class C ...	5,745,185	5,170,176	4,885,034	4,442,249	4,618,732
Class D ...	5,621,288	6,005,263	5,845,914	5,504,763	4,745,362
Class E ...	9,394,285	10,698,092	10,329,067	8,214,674	7,107,773
Total .	33,152,351	36,515,587	36,332,021	33,193,626	31,677,936

At the same time the use of bituminous compounds to surface city streets increased in the larger cities, but decreased in the smaller cities, during the period under review. Although the five Class A cities laid 24.6 per cent more bituminous pavement in 1929 than in 1925 and the eight Class B cities 17.5 per cent more, the 24 Class C cities laid 19.6 per cent less bituminous pavement in 1929 than in 1925; the 51 Class D cities, 15.6 per cent less; and the 113 Class E cities, 24.3 per cent less in 1929 than in 1925. The proportionate share of the larger cities in the total increased during the period under consideration, while that of the smaller cities decreased. Class A cities laid 29.2 per cent of the total in 1925 and 37.9 per cent in 1929. Class B cities laid 8.2 per cent of the whole in 1925 and 10.1 per cent in 1929. The share of Class C cities in the total decreased from 17.3 per cent in 1925 to 14.6 per cent in 1929; that of Class D cities, from 17.0 per cent in 1925 to 15.0 per cent in 1929; and that of Class E cities from 28.3 per cent in 1925 to 22.4 per cent in 1929.

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Sheet Asphalt. - Seven-eighths of all sheet asphalt laid in the 201 cities was laid east of the Mississippi River and Lake Michigan. Four-fifths (79.6 per cent) of the total was laid in the Northeastern district and 8.3 per cent, in the Southeastern district. West of the Mississippi River only 7.6 per cent of the national total was laid in the Pacific-Rocky Mountain district, only 2.6 per cent in the North-Central district, and only 2.0 per cent in the Southwestern district.

Sheet asphalt street pavement laid in 201 cities, 1925-1929, by geographic districts
(In square yards)

District	1925	1926	1927	1928	1929
Northeastern	14,634,643	15,740,390	16,798,662	15,813,943	14,047,248
Southeastern	1,720,065	1,308,629	2,431,319	1,134,891	1,410,150
Southwestern	491,412	479,351	304,213	459,133	182,575
North Central	639,058	585,026	374,612	439,726	437,831
Pacific-Rocky Mountain	1,290,833	1,375,977	1,496,066	1,287,432	1,854,291
Total	18,776,011	19,489,373	21,404,872	19,135,125	17,932,095

Most of the sheet asphalt was laid in the larger cities. Nearly half (49.7 per cent) of the total area of streets surfaced with sheet asphalt from 1925 to 1929 was in the five Class A cities with populations of more than 1,000,000. Eight Class B cities, containing from 500,000 to 1,000,000 residents, put down 10.8 per cent of the total. An almost equal proportion, 11.1 per cent, was in the 24 Class C cities, with populations of 250,000 to 500,000; and a slightly larger fraction, 12.0 per cent, in 51 Class D cities, whose populations ranged between 100,000 and 200,000. The remaining 16.5 per cent was distributed among 113 municipalities of Class E, with less than 100,000 inhabitants each.

Sheet asphalt street pavement laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A ...	8,636,971	9,724,850	10,436,770	9,598,608	9,634,009
Class B ...	1,734,716	2,038,197	2,294,740	2,192,673	2,224,408
Class C ...	2,492,968	1,965,390	2,131,229	2,243,750	1,892,238
Class D ...	2,271,972	2,511,297	2,839,013	2,270,972	1,672,470
Class E ...	3,639,384	3,249,139	3,703,120	2,829,122	2,508,970
Total ..	18,776,011	19,489,373	21,404,872	19,135,125	17,932,095

Although the area of sheet asphalt laid was 14.0 per cent greater in 1927 than in 1925, the yardage laid in 1929 was 16.2 per cent less than in 1927, the peak year. The largest relative decreases took place in the smaller cities. In Class D cities 26.4 per cent less sheet asphalt was laid in 1929 than in 1925, and in Class E cities 31.1 per cent less. In Class B cities, on the other hand, the yardage of sheet asphalt laid in 1929 exceeded that laid in 1925 by 28.2 per cent. In Class A cities the yardage of sheet asphalt pavement followed the

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general national trend of all bituminous paving and of all street pavements, rising to a peak in 1927 and decreasing in 1928 and 1929. Yet the yardage of sheet asphalt laid in Class A cities in 1929 was 11.6 per cent larger than that laid in 1925. As a result of these varying rates of decrease, the ratio of sheet asphalt laid in Class A cities to the total increased from 46.0 per cent in 1925 to 53.7 per cent in 1929, and in Class B cities from 9.2 per cent in 1925 to 12.4 per cent in 1929. On the other hand, the share of Class C cities decreased from 13.3 per cent of the whole in 1925 to 10.6 per cent in 1929, of Class D cities from 12.1 per cent in 1925 to 9.3 per cent in 1929, and of Class E cities from 19.4 per cent in 1925 to 14.0 per cent in 1929.

From the geographic point of view, the largest decreases in the use of sheet asphalt for street paving took place in interior United States west of the Mississippi River and Lake Michigan and east of the Rocky Mountains. In the Southwestern district 62.8 per cent less sheet asphalt was laid in 1929 than in 1925; and in the North-Central district, 31.5 per cent less. In the Southeastern district sheet asphalt paving decreased 18.0 per cent during the same period.

The use of sheet asphalt for street paving tended to be concentrated to a greater extent in the northeastern quarter of the country and on the Pacific coast. Cities of the Northeastern district laid 77.8 per cent of the total sheet asphalt in 1925 and 78.1 per cent in 1929; and cities of the Pacific-Rocky Mountain district, 6.9 per cent of the total in 1925 and 10.3 per cent in 1929.

Asphaltic Concrete. - Only two-fifths of the asphaltic concrete laid from 1925 to 1929, inclusive, in the 201 cities comprised in this survey was put down east of the Mississippi River. Less than one-third (30.7 per cent) was laid in the Northeastern district, although this district laid 61.7 per cent of the total bituminous pavement. In the Southeastern district 8.8 per cent of the total asphaltic concrete was put down, which corresponded fairly well with the 8.9 per cent of all bituminous pavements laid. West of the Mississippi River more than one-third (36.0 per cent) was put down in the Pacific-Rocky Mountain district, although this district laid only 16.3 per cent of all bituminous paving. In the Southwestern district, the proportion of the total asphaltic concrete laid, 18.1 per cent, was almost double the proportion, 9.2 per cent, of all asphaltic pavements. Only 6.4 per cent of the total asphaltic concrete was laid in the North Central district, which laid only 3.9 per cent of the total bituminous pavement.

Asphaltic concrete street pavement laid in 201 cities, 1925-1929, by geographic districts
(In square yards)

District	1925	1926	1927	1928	1929
Northeastern	3,230,736	3,263,644	3,379,085	2,951,764	2,460,161
Southeastern	783,777	1,019,797	886,503	921,782	760,610
Southwestern	1,661,126	1,932,728	2,067,804	1,738,035	1,588,957
North-Central	1,030,836	695,946	720,729	401,633	352,941
Pacific-Rocky Mountain	3,138,667	5,276,585	2,705,159	3,716,472	3,065,908
Total	9,845,142	12,188,700	9,759,280	9,729,686	8,228,577

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The use of asphaltic concrete for city street paving increased 23.8 per cent, from 9,845,142 square yards in 1925 to a maximum of 12,188,700 square yards in 1926, then decreased until only 8,228,577 square yards was laid in 1929, or 16.4 per cent less than in 1925. Except in the North Central district, where the laying of asphaltic concrete dropped 65.8 per cent from 1925 to 1929, this trend was general throughout the nation. In the Pacific-Rocky Mountain district the changes were more exaggerated.

More than three-fourths of the asphaltic concrete was laid from 1925 to 1929 in cities of less than 500,000 population, and more than five-ninths of it in cities of less than 250,000 population. The five Class A cities with populations of more than 1,000,000, laid only 13.5 per cent of the total; and the eight Class B cities, ranging in population from 500,000 to 1,000,000, only 9.0 per cent. The 24 Class C cities laid 21.6 per cent of the asphaltic concrete, although they laid only 14.7 per cent of the total bituminous pavement. Similarly, the 51 Class D cities, containing 100,000 to 250,000 inhabitants, laid 23.6 per cent of the asphaltic concrete, but only 17.1 per cent of the total bituminous pavement. Nearly one-third (32.4 per cent) of the asphaltic concrete was laid in the 113 Class D cities of less than 100,000 population, although these laid only 26.8 per cent of the total bituminous pavement.

Asphaltic concrete street pavement laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A ...	840,157	1,430,852	1,159,674	1,771,392	1,496,198
Class B ...	859,463	956,510	886,133	884,842	885,421
Class C ...	2,591,872	2,717,049	2,052,788	1,545,745	1,837,570
Class D ...	2,614,112	2,403,611	2,375,969	2,476,083	1,856,345
Class E ...	2,939,538	4,680,678	3,284,716	3,051,624	2,153,043
Total ..	9,845,142	12,188,700	9,759,280	9,729,686	8,228,577

Asphaltic Macadam. - The use of asphaltic penetration macadam to surface city streets is localized largely in the northeastern quarter of the United States. Six-sevenths (85.5 per cent) of the total area of macadam treated with asphalt by the penetration method put down from 1925 to 1929, inclusive, in the 201 cities was laid north of the Potomac and Ohio Rivers and east of the Mississippi River and Lake Michigan, chiefly in Massachusetts, Connecticut, Rhode Island, and Illinois. Of the remaining one-seventh the greater part was spread in the North-Central district lying west of Lake Michigan and the Mississippi River, chiefly in Wisconsin.

Asphaltic macadam street pavement laid in 201 cities, 1925-1929, by geographic districts
(In square yards)

District	1925	1926	1927	1928	1929
Northeastern	1,157,272	1,261,976	1,113,494	1,464,102	2,292,282
Southeastern	41,217	31,680	16,250	69,628	41,193
Southwestern	--	--	--	--	151,192
North-Central	148,446	209,052	240,092	185,589	101,566
Pacific-Rocky Mountain	--	--	--	--	587
Total	1,346,935	1,502,708	1,369,836	1,719,319	2,586,820

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Even more than asphaltic concrete, the use of asphaltic penetration macadam is characteristic of the smaller cities and towns. Nearly four-fifths of the asphaltic macadam laid in the 201 cities canvassed was put down in municipalities having populations of less than 250,000. Nearly one-half (49.4 per cent) was laid in Class E cities with less than 100,000 residents; and three-tenths (29.6 per cent) in Class D cities numbering from 100,000 to 250,000 inhabitants. Only one-eighth (12.2 per cent) of the total was laid in the five Class A cities with over 1,000,000 population; and only 8.7 per cent in the eight Class B cities ranging in population from 500,000 to 1,000,000.

Asphaltic macadam street pavement laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A ...	126,851	190,327	85,462	133,597	503,789
Class B ...	122,385	186,501	149,814	193,495	88,382
Class C ...	2,003	---	---	5,931	---
Class D ...	356,142	475,702	278,859	549,633	868,316
Class E ...	739,554	649,678	855,701	836,663	1,126,353
Total ..	1,346,935	1,502,708	1,369,836	1,719,319	2,586,820

Asphalt Block

All of the asphalt block was laid east of the Mississippi River. More than seven-tenths (71.9 per cent) of the total was laid in the Southeastern district, lying south of the Potomac and Ohio Rivers, all in Florida, and only 28.1 per cent in the Northeastern district, lying north of those rivers, almost entirely in New York and Ohio.

Nearly three-fifths of all asphalt block set in the 201 cities was laid in Class E municipalities of less than 100,000 inhabitants, and 27 per cent in Class D cities, with populations of 100,000 to 250,000. The remaining one-seventh was laid in the city of New York.

Native Rock Asphalt. - Nearly five-sixths (82.5 per cent) of the total area surfaced with native rock asphalt in the 201 cities during the five years ended December 31, 1929, was laid in the Southwestern district, chiefly in Texas, Louisiana, Oklahoma, and Kansas. Only 9.2 per cent was laid in the Southeastern district, chiefly in Alabama, Tennessee, and West Virginia, and only 8.3 per cent in the Northeastern district, chiefly in Illinois and Ohio.

Native rock asphalt street pavement laid in 201 cities, 1925-1929, by geographic districts
(In square yards)

	1925	1926	1927	1928	1929
Northeastern	88,209	129,109	78,756	111,617	9,564
Southeastern	67,922	39,926	75,835	103,344	172,096
Southwestern	696,594	645,409	1,008,694	884,979	905,120
North-Central	---	---	---	---	---
Pacific-Rocky Mountain	---	---	---	---	---
Total.....	852,725	814,444	1,163,335	1,099,940	1,086,780

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Seven-tenths of the rock asphalt was laid in cities of middle size during the period from 1925 to the end of 1929. Over five-ninths (57.1 per cent) was laid in Class C cities, with populations ranging between 250,000 and 500,000; and 13.5 per cent in Class D cities, containing from 100,000 to 250,000 inhabitants. Class E cities, which numbered less than 100,000 residents, laid 27.7 per cent.

Native rock asphalt street pavement laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A	---	---	31,724	49,918	---
Class B	4,570	3,690	---	---	---
Class C	591,754	427,884	540,141	505,789	796,924
Class D	79,096	10,484	118,210	197,794	273,943
Class E	177,305	372,386	473,260	346,439	15,913
Total	852,725	814,444	1,163,335	1,099,940	1,086,780

Miscellaneous Bituminous Pavements. - Three-fifths of the total area of miscellaneous bituminous types of surfacing laid in the 201 cities was put down in the Northeastern district. Over three-tenths (31.1 per cent) was laid in the Pacific-Rocky Mountain district, especially in California. Only 5.8 per cent of the total was laid in the Southwestern district, and only 3.2 per cent in the Southeastern district.

Miscellaneous bituminous street pavements laid in 201 cities, 1925-1929, by geographic districts
(In square yards)

District	1925	1926	1927	1928	1929
Northeastern	877,808	958,502	907,272	898,432	1,110,884
Southeastern	104,888	121,408	10,188	--	20,496
Southwestern	52,529	41,457	117,026	91,803	153,534
North-Central	---	---	---	---	1,783
Pacific-Rocky Mountain	765,357	398,445	581,203	305,235	413,179
Total	1,800,582	1,519,812	1,615,689	1,295,470	1,699,876

Five-sixths (82.9 per cent) of the area of miscellaneous bituminous types of pavement laid in the 201 cities from January 1, 1925, to December 31, 1929, was put down in Class E cities of less than 100,000 inhabitants each. Six per cent was laid in Class D cities of 100,000 to 250,000 residents, 6.6 per cent in Class C cities of 250,000 to 500,000 population, and 4.4 per cent in Class A cities numbering over 1,000,000 inhabitants.

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Miscellaneous bituminous street pavements laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A	--	49,903	111,581	144,376	327,277
Class B	--	--	--	--	--
Class C	66,538	59,353	160,876	141,034	92,000
Class D	134,133	278,373	42,177	9,009	18,385
Class E	1,599,861	1,132,183	1,301,055	1,002,051	1,262,214
Total	1,800,582	1,519,812	1,615,689	1,295,470	1,699,876

Portland-Cement Concrete

The total street area surfaced with Portland-cement concrete increased 26.1 per cent, from 9,050,054 square yards in 1925 to 11,407,851 square yards in 1926, 39.5 per cent to 15,908,957 square yards in 1927, but declined 0.1 per cent to 15,889,144 square yards in 1928, and dropped 13.3 per cent to 13,777,081 square yards in 1929. From 1925 to 1927 the yardage of Portland-cement concrete increased 75.8 per cent, while the total area of street pavement laid in the 201 cities increased only 22.7 per cent. The decrease of 0.1 per cent in Portland-cement pavement from 1927 to 1928 coincided with a decrease of 7.5 per cent in the yardage of all types of pavement, but the decrease of 13.3 per cent in the area of Portland-cement concrete laid from 1928 to 1929 was greater than the decline of 8.7 per cent in the total pavement laid.

Three-fifths of the Portland-cement concrete pavement laid in the 201 cities from 1925 to 1929, inclusive, was put down west of the Mississippi River and Lake Michigan, although only 35.8 per cent of the total pavement was laid in this vast region. Nearly two-fifths (39.3 per cent) was laid in 22 cities of the Pacific-Rocky Mountain district, although these cities contained only 10.6 per cent of the total population and laid only 20.7 per cent of the total pavement. More than one-fourth (27.4 per cent) of the total was laid in California, although this State laid only one-sixth (16.1 per cent) of the total street pavement. Cities of the North-Central district laid 13.6 per cent of the Portland-cement concrete, but only 6.4 per cent of the total pavement; and cities of the Southwestern district, 8.1 per cent of the Portland-cement concrete, in comparison with 8.7 per cent of the total pavement. East of the Mississippi River, nearly one-third (32.0 per cent) was laid in the Northeastern district, which put down 55.0 per cent of the total pavement; and 7.0 per cent in the Southeastern district, which laid 9.2 per cent of the total pavement.

Portland-cement concrete street pavement laid in 201 cities, 1925-1929, by geographic districts
(In square yards)

District	1925	1926	1927	1928	1929
Northeastern	2,636,091	3,558,965	5,458,370	4,838,113	4,655,813
Southeastern	846,621	809,962	1,023,251	992,050	955,223
Southwestern	908,577	1,040,725	1,064,695	1,030,400	1,289,727
North-Central	1,910,141	1,847,964	2,056,513	1,571,858	1,621,428
Pacific-Rocky Mountain	2,748,624	4,150,235	6,306,128	7,456,723	5,254,890
Total	9,050,054	11,407,851	15,908,957	15,889,144	13,777,081

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The national trend in the use of Portland-cement concrete for street paving was paralleled fairly closely by the Pacific-Rocky Mountain district and the Northeastern district, and in a general way by the Southeastern district and the North-Central district. In the Southwestern district the use of Portland cement concrete for street paving increased moderately and fairly evenly up to 1928, but rose sharply in 1929.

From 19.1 per cent in 1925 the share of Portland-cement concrete in the total area of paving laid grew steadily to 29.7 per cent in 1928, but dropped to 28.2 per cent in 1929. The highest proportionate gain over the whole period took place in the Northeastern district, where the share of Portland-cement concrete in the total rose from 9.9 per cent in 1925 to 17.1 per cent in 1929. In the Southeastern district the ratio of Portland-cement concrete to the whole paving increased from 17.9 per cent in 1925 to 26.4 per cent in 1929, after a brief drop in 1926. In the Southwestern district the proportion of Portland-cement concrete to the total pavement, after varying from 1925 to 1928 between 21.5 and 23.5 per cent, rose in 1929 to 28.0 per cent. In the North-Central district a slow but fairly steady increase brought the percentage of Portland-cement concrete from 49.6 per cent of the total pavement in 1925 to 58.8 per cent in 1929. West of the Rocky Mountains the share of Portland-cement concrete in the total paving increased from 34.6 per cent in 1925 to 58.6 per cent in 1928, but dropped to 49.6 per cent in 1929.

In general, the use of Portland-cement concrete for street paving is distributed among cities of various sizes roughly in proportion to the total pavement laid. For instance, Class A cities laid 30.0 per cent of the Portland-cement concrete and 31.5 per cent of the total paving laid in the 201 municipalities. Class B cities laid 7.8 per cent of the Portland-cement concrete and 9.4 per cent of the total pavement. More variation is shown in the medium-sized and smaller cities. In Class C cities 22.0 per cent of the Portland-cement concrete was laid as compared with 16.4 per cent of the total pavement. Class D cities laid 18.8 per cent of the Portland-cement concrete and 16.7 per cent of the total pavement; and Class E cities, 21.4 per cent of the Portland-cement concrete and 25.9 per cent of the total pavement.

Portland-cement concrete street pavement laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A	1,873,737	2,776,423	5,060,395	5,650,751	4,421,605
Class B	604,374	963,141	1,223,780	1,243,799	1,132,310
Class C	2,249,853	2,518,514	3,426,845	3,385,838	2,959,896
Class D	2,074,780	2,371,868	2,594,545	2,679,039	2,674,530
Class E	2,247,310	2,777,905	3,603,392	2,929,717	2,588,740
Total ...	9,050,054	11,407,851	15,908,957	15,889,144	13,777,081

The trend in the use of Portland-cement concrete was fairly generally distributed throughout cities of all sizes. In Class A and Class B cities the rate of increase up to 1928 and the rate of decrease in 1929 were sharper than

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the general trend and in Class C cities they were remarkably parallel to it. In Class D cities there was a fairly even rate of increase from 1925 to 1929. In Class E cities, however, the peak was reached in 1927 and the decline from 1927 to 1929 was sharper than the general decline.

Brick, Block, and Stone

The area of city streets surfaced with vitrified brick, wood block, stone block or slab, increased 12.2 per cent, from 5,084,180 square yards in 1925 to 5,703,273 square yards in 1927, but dropped 22.4 per cent to 4,412,155 square yards in 1928 and 21.9 per cent to 3,413,019 square yards in 1929. The rate of increase for brick, block, and stone pavements from 1925 to 1927 was more than one-third less than the general rate of increase in paving, while the rates of decrease from 1927 to 1929 were more than three times the general rate of decrease in all paving. The share of brick, block, and stone in paving the city streets decreased steadily from 10.8 per cent in 1925 to 7.0 per cent in 1929.

Nine-tenths of all brick, block, and stone street pavements laid in the 201 cities was put down east of the Mississippi River and Lake Michigan. Nearly three-fourths (74.1 per cent) was laid north of the Potomac and Ohio Rivers, and 15.9 per cent in the Southeastern States. West of the Mississippi River and Lake Michigan, only 6.4 per cent of the national total was laid in the Southwestern district, only 3.6 per cent in the North-Central district, and only 0.1 per cent in the Pacific-Rocky Mountain district.

Brick, block, and stone street pavements laid in 201 cities, 1925-1929, by geographic districts
(In square yards)

District	1925	1926	1927	1928	1929
Northeastern	3,844,391	3,607,570	4,386,283	3,487,052	2,624,952
Southeastern	873,768	1,584,816	750,965	425,203	205,749
Southwestern	225,983	288,030	380,280	305,227	338,633
North-Central	125,377	133,041	182,722	193,720	240,081
Pacific-Rocky Mountain	14,661	1,865	3,023	953	3,604
Total	5,084,180	5,615,322	5,703,273	4,412,155	3,413,019

The sharpest decreases in the use of brick, block, and stone pavements occurred in the Southeastern district, where only 23.6 per cent of the area surfaced with brick, block, and stone in 1925 was so paved in 1929; and in the Northeastern district, where only 68.3 per cent of the area paved with brick, block, and stone in 1925 was so paved in 1929. In the Southwestern district, however, the area paved with brick, block, and stone was 49.9 per cent larger in 1929 than in 1925; and in the North-Central district, 91.5 per cent larger.

Brick, block, and stone pavements were laid chiefly in the largest and in the smallest of the 201 cities. Three-tenths (29.9 per cent) of the total yardage of brick, block, and stone street pavement was laid in the five Class A

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cities, chiefly in New York, and 30.2 per cent in the 113 Class E cities. Eight Class B cities laid 13.9 per cent of the total; 24 Class C cities, 13.5 per cent; and 51 Class D cities, 12.5 per cent.

Brick, block, and stone street pavement laid in 201 cities, 1925-1929, by population groups
(In square yards)

	1925	1926	1927	1928	1929
Class A	1,539,116	1,651,378	1,855,122	1,303,068	885,675
Class B	758,067	569,902	770,553	596,968	681,389
Class C	527,737	574,532	792,642	656,745	717,946
Class D	548,639	1,017,327	487,495	488,518	492,261
Class E	1,710,621	1,802,183	1,797,461	1,366,856	635,748
Total	5,084,180	5,615,322	5,703,273	4,412,155	3,413,019

From the standpoint of size, the most marked decreases in the use of brick, block, and stone pavements took place in the largest and in the smallest cities. In Class A cities the use of brick, block, and stone to pave city streets decreased 42.4 per cent from 1925 to 1929 and in Class E cities 62.8 per cent. In Class B cities the street area surfaced with brick, block, and stone was only 10.1 per cent less than 1925, and in Class D cities only 10.3 per cent less. On the other hand, in Class C cities the area surfaced with brick, block, and stone was 36.0 per cent larger.

DISCUSSION BY DISTRICTS

Northeastern District

Five-ninths (55.2 per cent) of all hard-surfaced pavements laid in the 201 cities comprised in this survey from 1925 to 1929, inclusive, were laid in the Northeastern district lying north of the Potomac and Ohio Rivers and east of the Mississippi River and Lake Michigan. The 113 cities of this district from which data were received contained 68.1 per cent of the total urban population covered by this survey. Nearly 49 per cent of its inhabitants live in cities of over 40,000 residents. Four of the five Class A cities of over 1,000,000 population, five of the eight Class B cities of 500,000 to 1,000,000 population, and 10 of the 24 Class C cities of 250,000 to 500,000 population lie in this district. Although the Northeastern district comprises only about 12.4 per cent of the area of continental United States, it contained in 1930 over 48 per cent of the total population and 64.4 per cent of the urban population living in communities of over 40,000 inhabitants. In it is conducted seven-tenths of the manufacturing of the Nation, as measured by the number of wage-earners, the value of products, and the primary horsepower employed.

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Street pavement laid in Northeastern district, 1925-1929, by types
(In square yards)

	1925	1926	1927	1928	1929
Sheet asphalt	14,634,643	15,740,390	16,798,662	15,813,943	14,047,248
Asphaltic concrete	3,230,736	3,263,644	3,379,085	2,951,764	2,460,161
Asphaltic macadam	1,157,272	1,261,976	1,113,494	1,464,102	2,292,282
Asphalt block	127,674	180,831	229,381	136,484	77,885
Natural rock asphalt	88,209	129,109	78,756	111,617	9,564
Other asphaltic types of paving	877,808	958,502	907,272	898,432	1,110,884
Tar macadam	114,433	39,055	27,917	10,099	10,000
Total bituminous	20,230,775	21,573,507	22,534,567	21,386,441	20,008,024
Portland-cement concrete	2,636,091	3,558,965	5,458,370	4,838,113	4,655,813
Brick, block, and stone	3,844,391	3,607,570	4,386,283	3,487,052	2,624,952
Total	26,711,257	28,740,042	32,379,220	29,711,606	27,288,789

Nearly three-fourths (73.0 per cent) of the street area paved in the Northeastern district from 1925 to 1929, inclusive, was surfaced with bituminous mixtures. Sheet asphalt constituted 72.9 per cent of all the bituminous pavements and 53.2 per cent of all hard-surfaced pavements laid in the district during that period. Five States, New York, Pennsylvania, Ohio, Michigan, and Illinois, laid nearly five-sixths of the sheet asphalt. Asphaltic concrete formed only 14.5 per cent of the total bituminous pavement; asphaltic penetration macadam, 6.9 per cent, miscellaneous bituminous types, 4.5 per cent of the bituminous surface. Only small percentages of asphalt block, of natural rock asphalt, and of coal-tar macadam were laid.

Although the total area surfaced with bituminous mixtures in the Northeastern district rose and fell with the increases and decreases in all paving from 1925 to 1929, it declined 1.1 per cent in yardage over the five-year period and dropped in relative importance from 75.7 per cent in 1925 to 73.3 per cent in 1929. A similar trend occurred in the laying of sheet asphalt. The decline in both the yardage and the relative importance of asphaltic concrete over the five-year period was largely compensated by an increase in the laying of asphaltic penetration macadam, especially in 1928 and 1929. Miscellaneous bituminous pavements generally rose in 1926, declined during 1927 and 1928 both in yardage and in relative importance, but rose in 1929 to a yardage 26.6 per cent larger than in 1925.

About 14.5 per cent of the total street pavement laid in the Northeast district from 1925 to 1929 consisted of Portland-cement concrete. During this period, the street area paved with Portland-cement concrete more than doubled, increasing from 2,636,091 square yards in 1925 to 5,458,370 square yards in 1927, but dropped to 4,838,113 square yards in 1928 and to 4,655,813 square yards in 1929. The rate of increase from 1925 to 1927, 107.1 per cent, was more than five times the general increase in paving in the Northeastern district during that period. On the other hand, the decrease of 14.7 per cent from 1927 to 1929 fell short of the rate of general decrease in paving this district, 15.9 per cent. Consequently, the proportion of Portland-cement concrete to total pavement increased fairly steadily from 9.9 per cent in 1925 to 17.1 per cent in 1929.

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About one-eighth (12.4 per cent) of the total area of street pavement laid in the Northeastern district consisted of vitrified brick, stone block or slab, or wood block.

The area of street pavement surfaced with brick, block, and stone in the Northeastern district increased from 3,844,391 square yards in 1925 to 4,386,283 square yards in 1927, but decreased to 3,487,052 square yards in 1928 and to 2,624,952 square yards in 1929. The increase of 14.3 per cent in brick, block, and stone pavement laid from 1925 to 1927 fell one-quarter short of the general increase of 21.2 per cent in all pavement laid in the Northeastern district, while the decrease of 20.5 per cent from 1927 to 1928 was two and one-half times the general decrease of 8.3 per cent in all paving laid in the Northeastern district; and the decrease of 24.7 per cent from 1928 to 1929 was nearly three times the general decrease of 8.5 per cent in all paving. Consequently, the share of brick, block, and stone pavements in the total street pavement laid in the Northeastern district decreased from 14.4 per cent in 1925, 12.6 per cent in 1926, and 13.5 per cent in 1927 to 11.7 per cent in 1928 and 9.6 per cent in 1929.

Southeastern District

Only 9.2 per cent of the total pavement comprised in this survey was laid in the Southeastern district, lying south of the Potomac and Ohio Rivers and east of the Mississippi and Pearl Rivers. Although the Southeastern district comprises 14.2 per cent of the total area of continental United States and contained 19.0 per cent of its total population in 1930, only 7.5 per cent of the total urban population contained in the 201 cities lived in the 28 cities which represent the Southeastern States. Sixteen of these cities have less than 100,000 inhabitants, nine of them from 100,000 to 250,000, and three of them from 250,000 to 500,000 each. None of the Class A cities, with populations exceeding 1,000,000 or Class B cities of 500,000 to 1,000,000 inhabitants, are situated in this area. Whereas 36.7 per cent of the population of continental United States in 1930 lived in cities and towns of over 40,000 inhabitants, only 15.6 per cent of the inhabitants of the Southeastern district in 1930 lived in communities of over 40,000 persons. The economic basis of the Southeastern States lies in agriculture rather than in manufacture, although manufacturing, especially of textiles, tobacco, steel, and wood products has increased rapidly in recent years.

Street paving laid in the Southeastern district increased 20.2 per cent, from 4,727,107 square yards in 1925 to 5,696,882 square yards in 1926, and 4.6 per cent to 5,956,072 square yards in 1927, then decreased 37.4 per cent to 3,714,401 square yards in 1928 and 2.5 per cent to 3,621,420 square yards in 1929. The most marked decrease took place in Florida where the yardage of all street pavement laid fell from a peak of 2,815,074 square yards in 1926 to 2,185,819 square yards in 1927, to 891,783 square yards in 1928, and to 278,859 square yards in 1929. Decreases during 1928 and 1929 in the street pavement laid in Georgia, North Carolina, South Carolina, and Kentucky more than offset the increases in Alabama, Tennessee, and Virginia.

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Street pavement laid in the Southeastern district, 1925-1929, by types of paving
(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt	1,720,065	1,508,629	2,431,319	1,134,891	1,410,150
Asphaltic concrete	783,777	1,019,797	886,503	921,782	760,610
Asphaltic macadam	41,217	31,680	16,250	69,628	41,193
Asphalt block	288,849	780,664	761,711	67,503	55,903
Natural rock asphalt	67,922	39,926	75,885	103,344	172,096
Other asphaltic types of paving	104,888	121,408	10,188	- -	20,496
Total bituminous	3,006,718	3,302,104	4,181,856	2,297,148	2,460,448
Portland-cement concrete	846,621	809,962	1,023,251	992,050	955,223
Brick, block, and stone	873,768	1,584,816	750,965	425,203	205,749
Total	4,727,107	5,696,882	5,955,072	3,714,401	3,621,420

The total yardage paved with bituminous mixtures in the Southeastern district increased from 3,006,718 square yards in 1925 to 4,181,856 square yards in 1927, but dropped to 2,297,148 square yards in 1928, and rose again to 2,460,448 square yards in 1929. The increase of 39.1 per cent in the area paved with bituminous mixtures from 1925 to 1927 exceeded by one-half the increase of 26.0 per cent in all pavement laid during that period. On the other hand, the decrease of 45.1 per cent in bituminous pavement laid from 1927 to 1928 was greater than the decrease of 37.6 per cent in the total pavement laid. In 1929 the bituminous pavement laid was 7.1 per cent greater than in 1928, although the total pavement laid in the Southeastern district was 2.5 per cent less. Accordingly, the ratio of the bituminous pavements laid to the total pavement laid increased from 63.6 per cent in 1925 to 70.2 per cent in 1927, dropped to 61.8 per cent in 1928 and rose to 67.9 per cent in 1929.

Although the yardage of Portland-cement concrete laid in the Southeastern States fluctuated from year to year, the net result was an increase of 12.8 per cent in 1929 over the yardage laid in 1925, while the total pavement laid in the Southeastern district decreased 23.4 per cent over the same period. The ratio of Portland-cement concrete to the total pavement varied as follows: 17.9 per cent in 1925, 14.2 per cent in 1926, 17.2 per cent in 1927, 26.7 per cent in 1928, and 26.4 per cent in 1929.

The area paved with brick, block, and stone in the Southeastern States increased from 873,768 square yards in 1925 to 1,584,816 square yards in 1926, then dropped at an increasing rate of decline to 205,749 square yards in 1929. More than five-eights of the total was laid in Florida, and consisted chiefly of vitrified brick.

More than half (52.5 per cent) of all bituminous pavements laid from 1925 to 1929, inclusive, in the 28 cities which represent the Southeastern district consisted of sheet asphalt. Asphaltic concrete of various types constituted 28.7 per cent of the whole, and asphalt block 12.8 per cent. Natural rock asphalt was used to surface only 3.0 per cent of the total area paved with bituminous compounds; asphaltic penetration macadam, only 1.3 per cent; and miscellaneous bituminous types, 1.7 per cent.

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The yardage of sheet asphalt pavements laid in the Southeastern district decreased 23.5 per cent, from 1,720,065 square yards in 1925 to 1,308,629 square yards in 1926, increased 85.8 per cent to 2,431,319 square yards in 1927, decreased 53.3 per cent to 1,134,891 square yards in 1928, and rose 24.2 per cent to 1,410,150 square yards in 1929. Sheet asphalt formed 57.2 per cent of the total bituminous pavements in 1925; 39.6 per cent in 1926; 58.1 per cent in 1927; 49.4 per cent in 1928; and 57.3 per cent in 1929.

The laying of asphaltic concrete in the Southeastern district was subject to less fluctuation than that of sheet asphalt. From 783,777 square yards in 1925 it rose to 1,019,797 square yards in 1926; fell to 886,503 square yards in 1927, rose again to 921,782 square yards in 1928, and dropped to 760,610 square yards in 1929. Three-fifths of the yardage of asphaltic concrete was laid in Alabama; the rest was variously apportioned among the remaining nine Southeastern States.

The area surfaced with asphalt block in the Southeastern district increased from 288,849 square yards in 1925 to 780,664 square yards in 1926 and 761,711 square yards in 1927, but dropped to 67,503 square yards in 1928 and 55,903 square yards in 1929. All the asphalt block was laid in Florida.

Southwestern District

Only 8.7 per cent of all hard-surfaced pavements put down in the 201 cities was laid from 1925 to 1929 in the Southwestern district, which lies west of Mississippi and Pearl Rivers and south of St. Louis, Kansas City, Wichita, Amarillo, and El Paso. The 20 cities of this district from which data were received contained 8.8 per cent of the total urban population covered by this survey. Nine of the 20 cities have less than 100,000 inhabitants, five contain from 100,000 to 250,000, five include from 250,000 to 500,000, and only one has more than 500,000 residents. None of the Class A cities of over 1,000,000 population is included in this district. Although the Southwestern district comprises 16.8 per cent of the area of continental United States, it contained in 1930 only 14.4 per cent of the total population and only 8.9 per cent of the urban population dwelling in communities of over 40,000 persons. Even more than the Southeastern district, its economy is based on the production of raw materials, agricultural, and mineral.

Street pavement laid in Southwestern district, 1925-1929, by types of paving

(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt	491,412	479,351	304,213	459,133	182,575
Asphaltic concrete	1,661,126	1,932,728	2,067,804	1,738,035	1,588,957
Asphaltic macadam	--	--	--	--	151,192
Asphalt block	--	--	--	--	--
Natural rock asphalt	696,594	645,409	1,008,694	884,979	905,120
Other asphaltic types of paving	52,529	41,457	117,026	91,803	153,534
Total bituminous	2,901,661	3,098,945	3,497,737	3,173,950	2,981,378
Portland-cement concrete	908,577	1,040,725	1,064,695	1,030,400	1,289,727
Brick, block, and stone	225,983	288,030	380,280	305,227	338,633
Total	4,036,221	4,427,700	4,942,712	4,509,577	4,609,738

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The total area of street pavement laid in the Southwestern district increased from 4,036,221 square yards in 1925 to a maximum of 4,942,712 square yards in 1927, dropped to 4,509,577 square yards in 1928, and rose to 4,609,738 square yards in 1929. Though the yardage laid in 1929 was 6.7 per cent less than that laid during the peak year of 1927, it was 14.2 per cent larger than that laid in 1925.

From 1925 to 1928 the area of bituminous pavements laid in the Southwestern district kept pace with the general increases and decreases in all types of paving. The area of bituminous paving rose 20.5 per cent from 2,901,661 square yards in 1925 to a peak of 3,497,737 square yards in 1927, but dropped 9.3 per cent to 3,173,950 square yards in 1928. In 1929, however, the total yardage of all bituminous pavements, 2,981,378 square yards, was 6.1 per cent less than in 1928, although the total area of all street pavement laid in 1920 was 2.2 per cent greater than in the preceding year. The ratio of bituminous pavements to the total pavement, which had fluctuated between 70 and 72 per cent from 1925 to 1928, dropped in 1929 to 64.7 per cent.

More than five-ninths (57.4 per cent) of all bituminous paving laid in the Southwestern district consisted of asphaltic concrete, and more than one-fourth (26.5 per cent) of natural rock asphalt. Five-sixths of the natural rock asphalt was laid in Texas and more than one-tenth in Louisiana. Sheet asphalt constituted only 12.2 per cent of the total bituminous paving; and miscellaneous bituminous types, 2.9 per cent.

The yardage of Portland-cement concrete pavement in the Southwestern district increased from 908,577 square yards in 1925 to 1,040,725 square yards in 1926 and 1,064,695 square yards in 1927, dropped to 1,030,400 square yards in 1928, and rose to 1,289,727 square yards in 1929. From 1925 to 1928 the ratio of Portland-cement concrete to total pavement varied between 21.5 and 23.5 per cent. In 1929, however, Portland-cement concrete formed 28.0 per cent of the whole area of street pavement.

The street area surfaced with brick, block, and stone in the Southwestern district increased both in yardage and in relative importance. From 225,983 square yards in 1925 it increased to 380,280 square yards in 1927, dropped to 305,227 square yards in 1928, and rose to 338,633 square yards in 1929. From 5.6 per cent of the total pavement in 1925, its ratio rose to 6.5 per cent in 1926, to 7.7 per cent in 1927, fell to 6.7 per cent in 1928, and rose again to 7.3 per cent in 1929.

North Central District

Only 6.4 per cent of the total area of street pavement laid in the 201 cities was put down in the North-Central district, which lies west of Lake Michigan and the Mississippi River, north of St. Louis, Kansas City, Wichita, and Amarillo, and east of the Rocky Mountains. Although this district comprises 22.2 per cent of the area of continental United States, it contained in 1930 only 8,7 per cent of the total population. The economic basis of this broad area lies almost entirely in grain-farming, stock raising, and dairying.

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Street pavement laid in North-Central district, 1925-1929, by types of paving
(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt	639,058	585,026	374,612	439,726	437,831
Asphaltic concrete	1,030,836	695,946	720,729	401,633	352,941
Asphaltic macadam	148,446	209,052	240,092	185,589	101,566
Asphalt block	--	--	--	--	--
Natural rock asphalt	--	--	--	--	--
Other asphaltic types of paving	--	--	--	--	1,783
Total bituminous	1,818,340	1,490,024	1,335,433	1,026,948	894,121
Portland-cement concrete	1,910,141	1,847,964	2,056,513	1,571,858	1,621,428
Brick, block, and stone	125,377	133,041	182,722	193,720	240,081
Total	3,853,858	3,471,029	3,574,668	2,792,526	2,755,630

The total area of street paving laid in the North-Central district declined 28.5 per cent, from 3,853,858 square yards in 1925 to 2,755,630 square yards in 1929. More than one-third (35.7 per cent) was laid in Wisconsin, 22.7 per cent in Iowa, 20.9 per cent in Nebraska, and 18.1 per cent in Minnesota. Street pavement laid in Nebraska cities decreased 83.9 per cent, from 1,342,528 square yards in 1925 to 214,924 square yards in 1929; and in Iowa cities, 49.1 per cent, from 1,017,811 square yards in 1925 to 517,849 square yards in 1929. On the other hand, street pavement laid in Wisconsin increased 63.4 per cent, from 792,107 square yards in 1925 to 1,294,116 square yards in 1929.

The laying of bituminous pavements in the North-Central district decreased considerably from 1925 to 1929 both in yardage and in relative importance. In yardage it decreased 50.8 per cent, from 1,818,340 square yards in 1925 to 894,121 square yards in 1929. In their ratio to the total pavement laid, bituminous pavements declined from 47.2 per cent in 1925 to 42.9 per cent in 1926, 37.4 per cent in 1927, 36.8 per cent in 1928, and 32.4 per cent in 1929. Nearly half (48.8 per cent) of the bituminous pavement consisted of asphaltic concrete, 37.7 per cent of sheet asphalt, and 13.5 per cent of asphaltic macadam. The chief decrease occurred in asphaltic concrete, of which the yardage laid in 1929 was only 34.2 per cent of that laid in 1925. Sheet asphalt fell off 31.5 per cent during the same period and asphaltic macadam fell 31.6 per cent.

At the same time, the laying of Portland-cement concrete in the North-Central district decreased in yardage in 1928 and 1929, but increased continuously in relative importance. From 1,910,141 square yards in 1925 the total yardage of Portland-cement concrete increased to 2,056,513 square yards in 1927, but dropped to 1,571,858 square yards in 1928 and 1,621,428 square yards in 1929. The ratio of Portland-cement concrete pavement to the total pavement, however, increased from 49.6 per cent in 1925 to 53.2 per cent in 1926, 57.5 per cent in 1927, 56.3 per cent in 1928, and 58.9 per cent in 1929.

Nearly twice as great an area was paved with brick, block, or stone in the North-Central district in 1929 as in 1925. From 125,377 square yards in 1925 the yardage of brick, block, and stone pavements increased to 240,081 square

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yards in 1929. By far the greater part of this yardage consisted of vitrified brick. At the same time the ratio of brick, block, and stone pavements to the total pavement laid increased from 3.2 per cent in 1925 to 3.8 per cent in 1926, 5.1 per cent in 1927, 6.9 per cent in 1928, and 8.7 per cent in 1929.

Pacific-Rocky Mountain District

One-fifth of all hard-surfaced pavements laid in the 201 cities from 1925 to 1929 were put down in the Pacific-Rocky Mountain district, which lies west of Great Falls, Cheyenne, Denver, Albuquerque, and El Paso. The 22 cities of this district from which data were received contained 10.2 per cent of the total population covered by this survey. Included in the 22 cities were one Class A city of over 1,000,000 population, one Class B city with a population between 500,000 and 1,000,000, four Class C cities with from 250,000 to 500,000 inhabitants, five Class D cities with 100,000 to 250,000 residents, and 11 Class E cities containing less than 100,000 persons. Although the Pacific-Rocky Mountain district comprised 34.4 per cent of the total area of continental United States, it contained in 1930 only 9.7 per cent of the total population and in 1930 only 9.7 per cent of the total population living in communities of more than 40,000. The basic industries of this district are chiefly agricultural and mining.

Street pavement laid in Pacific-Rocky Mountain district, 1925-1929, by types of paving
(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt.....	1,290,833	1,375,977	1,496,066	1,287,432	1,854,291
Asphaltic concrete	3,138,667	5,276,585	2,705,159	3,716,472	3,065,908
Asphaltic macadam	--	--	--	--	587
Asphalt block	--	--	--	--	--
Other asphaltic types of paving	765,357	398,445	581,203	305,235	413,179
Total bituminous	5,194,857	7,051,007	4,782,428	5,309,139	5,333,965
Portland-cement concrete	2,748,624	4,150,235	6,306,128	7,456,723	5,254,890
Brick, block, and stone	14,661	1,865	3,023	953	3,604
Total	7,958,142	11,203,107	11,091,579	12,766,815	10,592,459

The total area of street pavement laid in the Pacific-Rocky Mountain district increased 40.8 per cent, from 7,958,142 square yards in 1925 to 11,203,107 square yards in 1926, remained virtually stationary at 11,091,579 square yards in 1927, increased 15.1 per cent to 12,766,815 square yards in 1928, and dropped 17.0 per cent to 10,592,459 square yards in 1929. Ninety-five per cent of the total was laid in the three Pacific States, and 77.4 per cent in California alone.

The total yardage of bituminous pavement laid in the Pacific-Rocky Mountain district increased 35.7 per cent, from 5,194,857 square yards in 1925 to 7,051,007 square yards in 1926, but dropped 32.2 per cent to 4,782,428 square

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yards in 1927, increasing 11.0 per cent to 5,309,139 square yards in 1928 and remaining practically level at 5,333,965 square yards in 1929. The ratio of bituminous pavements to the entire area of street pavement decreased from 65.3 per cent in 1925 to 62.9 per cent in 1926, dropped to 43.1 per cent in 1927 and to 41.6 per cent in 1928, and rose to 50.4 per cent in 1929.

Sixty-five per cent of all bituminous surfaces laid in the Pacific-Rocky Mountain district consisted of asphaltic concrete of various types. Sheet asphalt formed only 26.4 per cent of the whole; and miscellaneous bituminous types, only 8.9 per cent.

The use of Portland-cement concrete for street paving in the Pacific Rocky Mountain district reached its peak in 1928 with 7,456,723 square yards, an increase of 71.3 per cent over the 2,748,624 square yards laid in 1925. In 1929, however, only 5,254,890 square yards of Portland-cement concrete was laid, a decrease of 29.5 per cent from the yardage laid in 1928 but an increase of 91.2 per cent over that laid in 1925. The ratio of Portland-cement concrete to the total pavement increased from 34.6 per cent in 1925 to 37.0 per cent in 1926, 56.8 per cent in 1927, and 58.5 per cent in 1928, but dropped to 49.5 per cent in 1929.

Ninety-eight per cent of the Portland-cement concrete was laid in the three Pacific States. Seven-tenths of the total was laid in California alone.

DISCUSSION BY POPULATION GROUPS

Class A Cities

In the five Class A cities with populations exceeding 1,000,000, the total yardage of new pavement and resurfacing laid increased 44.1 per cent from 13,083,312 square yards in 1925 to 18,856,836 square yards in 1927. The yardage laid in 1928 was nearly equal to that laid in 1927, but the 17,315,158 square yards laid in 1929 was 7.5 per cent less than the 18,714,749 square yards laid in 1928.

Marked divergences from the general trend of street paving in Class A cities from 1925 to 1929 were shown by the various types of street paving. Bituminous pavements in general increased 23.5 per cent in area from 1925 to 1927, decreased 1.5 per cent in 1928, and rose 2.1 per cent in 1929, to a figure 24.2 per cent higher than in 1925. Their share in the total pavement dropped from 73.9 per cent in 1925 and 72.1 per cent in 1926 to 63.3 per cent in 1927 and 62.8 per cent in 1928, but rose to 69.3 per cent in 1929. The area of Portland-cement pavements increased 170 per cent from 1925 to 1927, and 11.7 per cent in 1928, but dropped 21.8 per cent in 1929. As a result, the ratio of Portland-cement concrete to the total pavement increased from 14.3 per cent in 1925 to 17.5 per cent in 1926, 26.8 per cent in 1927, and 30.2 per cent in 1928, but dropped to 25.5 per cent in 1929. Brick, block, and stone pavements showed a smaller proportionate increase up to their peak in 1927, and a greater proportionate decrease. Their share in the total pavement decreased from 11.8 per cent in 1925 and 10.4 per cent in 1926 to 9.8 per cent in 1927, 7.0 per cent in 1928, and 5.1 per cent in 1929.

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Street pavement laid in Class A cities, 1925-1929, by types of paving
(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt	8,636,971	9,724,850	10,436,770	9,598,608	9,634,009
Asphaltic concrete	840,157	1,430,852	1,159,674	1,771,392	1,496,198
Asphaltic macadam	126,851	190,827	85,462	133,597	503,789
Asphalt block	66,480	60,726	116,108	63,039	46,605
Natural rock asphalt	---	--	31,724	49,918	---
Other asphaltic types of paving	--	49,903	111,581	144,376	327,277
Total bituminous	9,670,459	11,457,158	11,941,319	11,760,930	12,007,878
Portland-cement concrete	1,873,737	2,776,423	5,060,305	5,650,751	4,421,605
Brick, block, and stone .	1,539,116	1,651,378	1,855,122	1,303,068	885,675
Total	13,083,312	15,884,959	18,356,836	18,714,749	17,315,158

Class B Cities

In the eight Class B cities with populations ranging from 500,000 to 1,000,000,--Baltimore, Boston, Buffalo, Cleveland, Milwaukee, Pittsburgh, St. Louis, and San Francisco--the general trend of paving was similar to that in the Class A cities. It rose 30.4 per cent from 4,083,575 square yards in 1925 to a peak of 5,325,020 square yards in 1927, fell off 4.0 per cent to 5,111,777 square yards in 1928, and 2.0 per cent to 5,011,890 square yards in 1929.

Bituminous pavements followed somewhat the general trend, increasing 21.6 per cent in area from 1925 to 1927, decreasing 1.8 per cent in 1928 and 2.3 per cent in 1929. As a result their share of the total pavement laid increased from 66.6 per cent in 1925 to 67.5 per cent in 1926, dropped to 62.5 per cent in 1927, rose to 64.0 per cent in 1928, and decreased to 63.8 per cent in 1929. The yardage of Portland-cement concrete doubled from 1925 to 1927, increased 1.2 per cent in 1928, but decreased 10.6 per cent in 1929. Its share in the total paving increased from 14.8 per cent in 1925 to 20.4 per cent in 1926, 23.0 per cent in 1927, and 24.3 per cent in 1928, but fell off to 22.6 per cent in 1929. The trend of brick, block, and stone paving in Class B cities from 1925 to 1929 was quite irregular. The yardage laid in 1929 was 10.2 per cent lower than in 1925 and the relative importance had dropped from 18.6 per cent of the total in 1925 to 13.6 per cent in 1929.

Street pavement laid in Class B cities, 1925-1929, by types of paving
(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt	1,734,716	2,038,197	2,294,740	2,192,673	2,224,408
Asphaltic concrete	859,463	956,510	886,133	884,842	885,421
Asphaltic macadam	122,385	186,501	149,814	193,495	88,362
Asphalt block	--	--	--	--	--
Natural rock asphalt ...	4,570	3,690	--	--	--
Other asphaltic types of paving	--	--	--	--	--
Total bituminous	2,721,134	3,184,898	3,330,687	3,271,010	3,198,191
Portland-cement concrete	604,374	963,141	1,223,780	1,243,799	1,132,310
Brick, block, and stone	758,067	569,902	770,553	596,968	681,389
Total	4,083,575	4,717,941	5,325,020	5,111,777	5,011,890

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Class C Cities

Less proportionate change occurred in the total pavement laid in Class C cities[6/] from 1925 to 1929 than in Class A or Class B cities. The total yardage laid decreased 3.3 per cent from 8,522,775 square yards in 1925 to 8,263,222 square yards in 1926; increased 10.2 per cent to a maximum of 9,104,521 square yards in 1927, decreased 7.3 per cent to 8,484,832 square yards in 1928, and 2.6 per cent to 8,296,574 square yards in 1929, 2.7 per cent less than the yardage laid in 1925. Bituminous pavements decreased about 7.5 per cent a year from 1925 to 1928 but increased 4 per cent in 1929. Their share in the total pavement laid decreased from 67.4 per cent in 1925 and 62.6 per cent in 1926 to 53.7 per cent in 1927 and 52.4 per cent in 1928, but rose to 55.7 per cent in 1929. On the other hand, Portland-cement concrete showed a sharp rise of 52.5 per cent from 1925 to 1927, followed by a decline of 1.2 per cent in 1928 and of 14.4 per cent in 1929. The share of Portland-cement concrete in the total pavement increased from 26.4 per cent in 1925 to 30.5 per cent in 1926, 37.6 per cent in 1927, and 39.9 per cent in 1928, but decreased 35.7 per cent in 1929. Brick, block, and stone pavements rose irregularly from 1925 to 1927, dropped in 1928, and rose in 1929. Their share in the total pavement rose from 6.2 per cent in 1925 to 7.0 per cent in 1926, 8.7 per cent in 1927, 7.7 per cent in 1928, and 8.6 per cent in 1929.

Street pavement laid in Class C cities, 1925-1929, by types of paving
(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt	2,492,968	1,965,890	2,131,229	2,243,750	1,892,238
Asphaltic concrete	2,591,872	2,717,049	2,052,788	1,545,745	1,837,570
Asphaltic macadam	2,003	--	--	5,931	--
Asphalt block	--	--	--	--	--
Natural rock asphalt	591,754	427,884	540,141	605,789	796,924
Other asphaltic types of paving	66,588	59,353	160,876	141,034	92,000
Total bituminous	5,745,185	5,170,176	4,885,034	4,442,249	4,618,732
Portland-cement concrete	2,249,853	2,518,514	3,426,845	3,385,838	2,959,896
Brick, block, and stone	527,737	574,552	792,642	656,745	717,946
Total	8,522,775	8,263,222	9,104,521	8,484,832	8,296,574

6/ The following cities, with populations ranging between 250,000 and 500,000, have been included in Class C: Akron, O.; Atlanta, Ga.; Birmingham, Ala.; Cincinnati, O.; Columbus, O.; Dallas, Tex.; Denver, Colo.; Houston, Tex.; Indianapolis, Ind.; Jersey City, N. J.; Kansas City, Mo.; Louisville, Ky.; Memphis, Tenn.; Minneapolis, Minn.; Newark, N. J.; New Orleans, La.; Oakland, Calif.; Portland, Oreg.; Providence, R. I.; Rochester, N. Y.; San Antonio, Tex.; Seattle, Wash.; Toledo, O.; and Washington, D. C.

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Class D Cities

The total area of street pavement laid in Class D cities[7/] increased 14.0 per cent, from 8,244,707 square yards in 1925 to 9,394,458 square yards in 1926. From this peak the area paved each year decreased until in 1929 only 7,912,153 square yards was laid, 4.2 per cent less than in 1925. Bituminous pavements in general shared in the increase in 1926 and in the decline from 1927 to 1929. Their ratio to the total pavement decreased from an average of 66 per cent between 1925 and 1927 to 63.6 per cent in 1928 and 60 per cent in 1929. Decreases in the yardage of sheet asphalt and of asphaltic concrete laid were largely compensated by increased yardage of asphaltic macadam, asphalt block, and natural rock asphalt. On the other hand, Portland-cement concrete increased steadily both in yardage and in importance. Its share in the total pavement increased from 25.2 per cent in 1925 and 1926 to 29.1 per cent in 1927, 30.8 per cent in 1928, and 33.8 per cent in 1929. Brick, block, and stone pavements, after a sharp rise in 1926, dropped in 1927, 1928, and 1929 to a level 12 per cent lower than in 1925. Their share in the total paving rose from 6.6 per cent in 1925 to 10.9 per cent in 1926, dropped to 5.4 per cent in 1927, and 5.6 per cent in 1928, and rose again to 6.2 per cent in 1929.

Street pavement laid in Class D cities, 1925-1929, by types of paving
(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt	2,271,972	2,611,297	2,839,013	2,270,972	1,672,470
Asphalt concrete	2,614,112	2,403,611	2,375,969	2,476,083	1,856,345
Asphaltic macadam	356,142	475,702	278,859	549,633	868,316
Asphalt block	165,833	325,796	191,686	2,272	55,909
Natural rock asphalt	79,096	10,484	118,210	197,794	273,943
Other asphaltic types of paving	134,133	278,373	42,177	8,009	18,385
Total bituminous	5,621,288	6,005,263	5,845,914	5,504,763	4,745,362
Portland-cement concrete	2,074,780	2,371,868	2,594,545	2,679,039	2,674,530
Brick, block, and stone..	548,639	1,017,327	487,495	488,518	492,261
Total	8,244,707	9,394,458	8,927,954	8,672,320	7,912,153

7/ The following cities, with populations ranging between 100,000 and 250,000, have been included in Class D: Albany, N. Y.; Birmingham, Ala.; Bridgeport, Conn.; Cambridge, Mass.; Camden, N. J.; Canton, O.; Chattanooga, Tenn.; Dayton, O.; Des Moines, Iowa; Duluth, Minn.; El Paso, Tex.; Elizabeth, N. J.; Fall River, Mass.; Flint, Mich.; Fort Wayne, Ind.; Fort Worth, Tex.; Grand Rapids, Mich.; Hamtramck, Mich.; Hartford, Conn.; Jacksonville, Fla.; Kansas City, Kans.; Knoxville, Tenn.; Long Beach, Calif.; Lowell, Mass.; Lynn, Mass.; Miami, Fla.; Nashville, Tenn.; New Bedford, Mass.; New Haven, Conn.; Norfolk, Va.; Oklahoma City, Okla.; Omaha, Nebr.; Richmond, Va.; St. Paul, Minn.; Salt Lake City, Utah; San Diego, Calif.; Savannah, Ga.; Scranton, Pa.; Somerville, Mass.; Spokane, Wash.; Syracuse, N. Y.; Tacoma, Wash.; Tampa, Fla.; Trenton, N. J.; Tulsa, Okla.; Utica, N. Y.; Wichita, Kans.; Wilmington, Del.; Worcester, Mass.; Yonkers, N. Y.; Youngstown, O.

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Class E Cities

The area of pavement laid in Class E cities 8/ increased 17.8 per cent, from 13,352,216 square yards in 1925 to 15,729,920 square yards in 1927, but decreased 21.1 per cent to 12,511,247 square yards in 1928 and 21.1 per cent again to 10,332,261 square yards in 1929. Bituminous pavements followed the general trend, reaching their peak, however, in 1926 instead of 1927. Their ratio to the total pavement decreased from 70.4 per cent in 1925 and 70.0 per cent in 1926 to 65.7 per cent in 1927 and 65.6 per cent in 1928, but rose to 68.8 per cent in 1929. The area paved with Portland-cement concrete rose sharply from 1925 to 1927, but dropped almost as sharply in 1928 and 1929. Its ratio to the total pavement increased steadily from 16.8 per cent in 1925 and 18.2 per cent in 1926 to 22.9 per cent in 1927, 23.4 per cent in 1928, and 25.1 per cent in 1929. Brick, block, and stone pavement, after a relatively small increase in 1926 and 1927, dropped sharply in 1928 and 1929. Its share in the total paving decreased from 12.8 per cent in 1925 to 11.8 per cent in 1926, 11.4 per cent in 1927, 10.9 per cent in 1928, and 6.1 per cent in 1929.

Street pavement laid in Class E cities, 1925-1929, by types of paving

(In square yards)

Type	1925	1926	1927	1928	1929
Sheet asphalt	3,639,384	3,249,139	3,703,120	2,829,122	2,508,970
Asphaltic concrete	2,939,538	4,680,678	3,284,716	3,051,624	2,153,043
Asphaltic macadam	739,554	649,678	855,701	836,663	1,126,353
Asphalt block	184,210	574,973	683,298	138,676	31,280
Natural rock asphalt ...	177,305	372,386	473,260	346,439	15,913
Other asphaltic types of paving	1,599,861	1,132,183	1,301,055	1,002,051	1,262,214
Tar macadam	114,433	39,055	27,917	10,099	10,000
Total bituminous	9,394,285	10,698,092	10,329,067	8,214,674	7,107,773
Portland-cement concrete	2,247,310	2,777,905	3,603,392	2,929,717	2,588,740
Brick, block, and stone	1,710,621	1,802,183	1,797,461	1,336,856	635,748
Total	13,352,216	15,278,180	15,729,920	12,511,247	10,332,261

8/ The following cities, with populations ranging for the most part between 40,000 and 100,000, are included in Class E: Allentown, Pa.; Altoona, Pa.; Atlantic City, N. J.; Augusta, Ga.; Aurora, Ill.; Austin, Tex.; Battle Creek, Mich.; Bayonne, N. J.; Beaumont, Tex.; Berkeley, Calif.; Bethlehem, Pa.; Binghamton, N. Y.; Boise, Idaho; Brockton, Mass.; Brookline, Mass.; Burlington, Vt Butte, Mont.; Cedar Rapids, Iowa; Charleston, S. C.; Charleston, W. Va.; Charlotte, N. C.; Chester, Pa.; Chicopee, Mass.; Cicero, Ill.; Columbia, S. C.; Columbuc, Ga.; Council Bluffs, Iowa; Davenport, Iowa; Decatur, Ill.; Dubuque, Iowa; Durham, N. C.; East Chicago, Ind.; East Orange, N. J.; East Saint Louis, Ill.; Elmira, N. Y.; Erie, Pa.; Evanston, Ill.; Evansville, Ind.; Everett, Mass.; Fargo, N. D.; Fitchburg, Mass.; Fresno, Calif.; Galveston, Tex.; Gary, Ind.; Hamilton, Ohio; Hammond, Ind.; Harrisburg, Pa.; Haverhill, Mass.; Highland Park, Mich.; Holyoke, Mass.; Huntington, W. Va.; Jackson, Mich.; Jackson, Miss.; Jamestown, N. Y.; Johnstown, Pa.; Joliet, Ill.; Kalamazoo, Mich.; Kenosha, Wis.; Kokomo, Ind.; Lakewood, Ohio; Lancaster, Pa.; Lansing, Mich.; Lawrence, Mass.; Lincoln, Nebr.; Lima, Ohio; Lorain, Ohio; Macon, Ga.; Madison, Wis.; Manchester, N. H.; Mobile, Ala.; Muskegon, Mich.; New Castle, Pa.; New Britain, Conn.; New Brunswick, N. J.; Newton, Mass.; Niagara Falls, N. Y.; Oak Park, Ill.; Pasadena, Calif.; Passaic, N. J.; Pawtucket, R. I.; Phoenix, Ariz.; Pontiac, Mich.; Portsmouth, Ohio; Portsmouth, Va.; Portland, Me.; Pueblo, Colo. Racine, Wis.; Reno, Nev.; Rockford, Ill.; Sacramento, Calif.; Saginaw, Mich.; San Jose, Calif.; St. Joseph, Mo.; St. Petersburg, Fla.; Schenectady, N. Y.; Sioux City, Iowa, Sioux Falls, S. Dak.; South Bend, Ind.; Springfield, Ill.; Springfield, Ohio, Stockton, Calif.; Superior, Wis.; Terre Haute, Ind.; Topeka Kans.; Waco, Tex.; Waterbury, Conn.; Wichita Falls, Tex.; Williamsport, Pa.; Wheeling, W. Va.; Winston-Salem, N. C.; Wilkes-Barre, Pa.; Woonsocket, R. I.; York, Pa.

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